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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/571,516	05/02/2006	Mitsuharu Sugita	F-9020	3268

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EXAMINER	
BROCKMAN, ANGEL T	

ART UNIT	PAPER NUMBER
2463	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/571,516	SUGITA ET AL.	
	Examiner	Art Unit	
	ANGEL BROCKMAN	2463	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 4-6 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only, and cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claim Rejections - 35 USC § 103

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1,4,and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al.(US 4,753,206, hereinafter Inoue) in view of Kaneyasu et al.(US 5,063,901, hereinafter Kaneyasu).

Regarding **claim 1,** Inoue discloses an AD converter for simultaneously receiving a plurality of time series signals representing physical and chemical phenomena and subjecting the signals to AD conversion (figure 3, 6p); a delay time calculation unit for calculating the time delay between arbitrary two signals input to the AD converter (col. 5, lines 9-6, lines 25-29,, wherein the CPU includes the delay calculation unit column 4, lines 16-25,col.5, lines 40-55,wherein the time delay is calculated); a time axis adjustment unit for advancing or delaying the time axis of one of the two arbitrary signals according to the time delay(column 7, lines 40-67, wherein the fuel flow rate TAU is advanced or delayed corresponding to DPM as calculated, column 5, lines 45-55). Inoue does not discloses a data analyzer for performing analysis such as determining mutual correlation coefficient by comparing the tow signals made to have the same time axis. Kaneyasu discloses a data analyzer for performing analysis such as determining mutual correlation coefficient by comparing the two signals made to have the same time axis (figure 17,175, figure 12, column 3, lines54-59, column 4, lines 25-29 wherein the microprocessor is the data analyzer). Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to utilize the mutual correlation as disclosed by

Kaneyasu along with the system of Inoue. The mutual correlation can be calculated in the CPU through software implementation. The motivation for utilizing the mutual correlation as disclosed by Kaneyasu along with the system of Inoue is to increase the efficiency of the system by optimizing control (Kaneyasu, column 2, lines 15-25).

Regarding **claim 4,** Inoue discloses all subject matter of the claimed invention with the exception of the time adjustment unit makes the other signal of the signals input to the AD converter to have the same time axis using the time axis of a selected one signal of the signals as a reference. Kaneyasu discloses adjustment unit makes the other signal of the signals input to the AD converter to have the same time axis using the time axis of a selected one signal of the signals as a reference (figure 10B, wherein REF is the reference signal, col.4, lines 43-50). Thus it would have been obvious to one of ordinary skill in the art at the time of invention to utilize reference signal as disclosed by Kaneyasu along with the system of Inoue. The reference signal can be implemented through software implementation. The motivation for utilizing the reference signal as disclosed by Kaneyasu along with the system of Inoue is to increase the efficiency of the system by optimizing control (Kaneyasu, column 2, lines 15-25).

Regarding **claim 6,** Inoue discloses result of analysis of the data analyzer is used to ECU control the engine (column 3, lines 60-65, column 4, lines 51-60). Inoue does not disclose the time series signals include at least the fuel flow rate, the number of generated torques, the speed, and the amount of exhaust gas of an automobile engine. Kaneyasu discloses the time series signals include at least the fuel flow rate (figure 17), the number of generated torques (fig 16), the speed(figure 13b), and the amount of exhaust gas of an automobile engine (figure 7).Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to utilize the signals of Kaneyasu along Inoue. The signals of Kaneyasu can be implemented through software implementation. The motivation for utilizing signals of Kaneyasu along with the system of Inoue is to increase the efficiency and control of the engine.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al.(US 4,753,206, hereinafter Inoue) and Kaneyasu et al.(US 5,063,901, hereinafter Kaneyasu) in view of Briggs et al.(US 3,134,896, hereinafter Briggs).

Regarding **claim 2,** Inoue discloses a delay time generation unit for applying a delay time to one signal (column 5, liens 45-55, wherein the time delay is 40 seconds). Inoue and Kaneyasu do not disclose correlation calculation unit for performing an integration processing after the one signal delayed by the delay time generation unit is multiplied by the other signal to determine the mutual correlation function representing a degree of similarity between the two signals; and a delay time controller for controlling the delay time in such a way that the value of the mutual correlation function is maximized, to thereby setting the delay time τ at such an instance to be the delay time

between the two signals. Briggs disclose correlation calculation unit for performing an integration processing after the one signal delayed by the delay time generation unit is multiplied by the other signal to determine the mutual correlation function representing a degree of similarity between the two signals;(column 7,lines 15-35, column 4, lines 30-37) and a delay time controller for controlling the delay time in such a way that the value of the mutual correlation function is maximized, to thereby setting the delay time τ at such an instance to be the delay time between the two signals (column 10, lines 1-11, column 16, lines 5-17, wherein $\tau=0$ at maximum). Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to utilize the correlation of Briggs along with the system of Kaneyasu and Inoue. The correlation can be implemented through software implementation. The motivation for utilizing the correlation as disclosed by Briggs along with the system of Kaneyasu and Inoue is to increase the efficiency of the system by improving correlation (Briggs, column 2, lines 9-25).

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al.(US 4,753,206, hereinafter Inoue) and Kaneyasu et al.(US 5,063,901, hereinafter Kaneyasu) in view of Rhode et al.(Review of Basic Signal Analysis, hereinafter, Rhode).

Regarding **claim 3,** Inoue and Kaneyasu disclose all subject matter of the claimed invention as set forth above in claim 1, with the exception of an FFT calculation unit for subjecting each of the two signals to a Fourier Transformation processing for transforming a time function to a frequency function; and an impulse response calculation unit for performing an averaging processing after multiplying the conjugate complex number of the one signal of the two signals subjected to the Fourier Transformation processing by the other signal, to thereby obtain an impulse response output representing

a degree of correlation between the two signals; wherein setting a time at which the value of the impulse response output reaches a peak as the delay time between the two signals. Rhode discloses an FFT calculation unit for subjecting each of the two signals to a Fourier Transformation processing for transforming a time function to a frequency function (page 3, wherein F1 and F2 are the two signals) ; and an impulse response calculation unit for performing an averaging processing after multiplying the conjugate complex number of the one signal of the two signals subjected to the Fourier Transformation processing by the other signal, to thereby obtain an impulse response output representing a degree of correlation between the two signals (page 6, wherein F1 * is the conjugate complex number); wherein setting a time at which the value of the impulse response output reaches a peak as the delay time between the two signals(page 6, wherein the peak is at time=0). Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to utilize the FFT and correlation of Rhode along with the system of Kaneyasu and Inoue. The FFT and correlation can be implemented through software implementation. The motivation for utilizing the FFT and correlation as disclosed by Rhode along with the system of Kaneyasu and Inoue is to increase the efficiency of the system by improving correlation between signals.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al.(US 4,753,206, hereinafter Inoue) and Kaneyasu et al.(US 5,063,901, hereinafter Kaneyasu) in view of Takaahashi et al.(US 5,012,422).

Regarding **claim 5,** Inoue discloses a delay time of 10 seconds or more as compared with the other signals (col.5, lines 52-54, wherein the time delay of 40 seconds includes delay time of 10 seconds or more). Inoue and Kaneyasu do not disclose wherein

the time series signals are signals including a steady state. Takaahashi discloses wherein the time series signals are signals including a steady state (figure 5). Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to utilize the FFT and steady state as disclosed by Takaahasi along with the system of Kaneyasu and Inoue. The steady state as disclosed by Takaahasi can be implemented through software implementation. The motivation for utilizing steady state as disclosed by Takaahasi along with the system of Kaneyasu and Inoue is to increase the efficiency of the system by improving correlation between signals.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Zhang et al. (US 7,191,591).

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANGEL BROCKMAN whose telephone number is (571)270-5664. The examiner can normally be reached on Monday-Friday ,7:30-5:00pm.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Derrick Ferris can be reached on 571-272-3123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ANGEL BROCKMAN
Examiner
Art Unit 2463

/A. B./
Examiner, Art Unit 2463
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